6x 8A -3 -6 -33 ChemRisk/Shonka Research Associates, Inc., Document Request Form

(This section to be completed by subc	ontractor requesting document)
Tom Vidner 1 K-25 5 Requestor Document Ce	te Records Inter (is requested to provide the following document)
- olooka	cted receipt of document 4/7/95
Document number Date	of document 1962-1963
Title and author (if document is unnumbered Radioactivity Analysis Reporting discontinued)	t - White Cak Lake Thoss Beta
- Pasi Copy entry Jolden - 1	nclude cover w/ trage title on the yellow to
(This section to be completed by Docul	nent Center)
Date request received3/27	95
Date submitted to ADC $\frac{1}{3}$	95
Date submitted to HSA Coordinator	3/27/95
(This section to be completed by HSA C	oordinator)
Date submitted to CICO	4/3/95
Date received from CICO	4/24/95
Date submitted to ChemRisk/Shonka and D	OE 4/25/95
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Radioactivity Analysis Report -White Oak Lake Gross Beta 1962-1963 (discontinued)

This document has been approved for release to the public by:

Technical Information Office Oak Ridge K-25 Site

MEMO		AVOID ORAL INSTR	RUCTIONS		Date	April	² 19 ⁶
	To	Mr. N. B. Schultz		Subject:		Analysis	
	CCI	Mr. D. L. Stoddard	D. L. Stoddard			s in Plant	Potable Wate
Please a	ırrange	to report the results of d	our daily wat	er sample	s from t	he K-15 15	sanitary
water in	take to	Mr. Abee's group at ORNL	through the	15th of A	pril, at	which time	e, if the
Clinch R	River fl	ow is restored, this should	ld be discont	inued. N	ir. Abee	will contin	nue to
composit	e the d	sily river samples on a mo	onthly basis	for a con	plete re	diochemica	l analysis
and will	furnis	h copies of the results to	o us. You ma	y therefo	re disco	ntimue all	future
sampling	et thi	s point except as requeste	ed or as you	may feel	desirable	e, and we w	will rely
on our c	onstant	water monitors to alert u	us to changin	g conditi	ons of s	ignificance	e. Please
		le this with the Utilities					

Signed.

UCN-486 (1235_3-59) AFB;mh 4/2/63 A. F. Becher

TO: a. T. Becker

20.01.77.	TOSK LINED		
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
XPX 413	±,	2428	Lew 100 ml.
	± ±	<u>+</u>	
1000	L t	±	
1	the table to table to the table to table t	±	
Aus to	NAG	±	
ALD) (4) ±	±	
/	±	±	
	± ~	±	
	±	<u> </u>	
	±	<u>+</u>	
	<u>±</u>	±	
	<u>±</u>	. ± .	
	<u>±</u>	. <u>+</u>	
	<u>±</u>	<u>±</u>	
	<u>+</u>	<u>±</u>	
	<u> </u>	±	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	
	±	<u>+</u> .	

File No. 1004C-265. C. Issued 10-15-63
Type of Sample Water

- The limit of error at the 95% certainty level has been estimated from the precision of control samples.
- 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

Safety and Meath
Physics
1963-001-16-141-2-1-6

APPROVED: approved:

File No K-10040-265PC

Issued 10-1-63

Type of Sample 7 water

TO: a.f. Bucher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-412	<u>±</u>	1696	per 100 ml
	<u> </u>	<u>+</u>	/
	<u>±</u>	<u>+</u>	
	土	<u> </u>	
	<u>+</u>	<u>±</u>	·
	<u>1.</u>	+	
	±	±	
	<u>+</u> 	±	
	<u>+</u>	<u></u>	
<u></u>	±	<u>+</u>	
	<u>±</u>	±	
	<u></u> ±	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±		
	<u>±</u>	÷	
	<u>:</u>	±	
	<u>+</u>	<u>+</u>	
	±	<u>+</u>	
	<u>±</u>	<u>±</u>	
	±	<u> </u>	
	±	±	
	<u>+</u>	±	
	<u>+</u>	• 4	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

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RADIOACTIVITY ANALYSIS REPORT

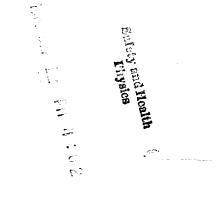
TO: O. F. Secher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
48/-411	±	272-3	ger 100 mc
	±	±	
	<u>±</u>	±	
	<u>±</u>		
	±	±	
	±	<u>.</u>	
	<u>±</u>	=	
	<u>+</u>	-	
	<u>+</u>		
	<u>±</u>	±	
	±	<u>+</u>	
	±	<u> </u>	
	<u>±</u>	<u>+</u>	
	±.	<u>+</u>	
	<u>±</u>	=	
	<u>÷</u>	=	
	±	<u>±</u>	,
	±	±	
	±	<u> </u>	·
	±	<u></u>	
	<u> </u>	±	
	±	±	

- File No. 1-10040-265RC

 Issued 9-11-63

 Type of Sample Wester
 - The limit of error at the 95% certainty level has been estimated from the precision of control samples.
 - 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
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File No. K-10040-365 RC Issued 8-26-63 Type of Sample Matter.

TO: a. F. Becker

<u> </u>	. Decker		
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HpX-410	±	4489	free 100 m
	±	<u>±</u>	, ,
	±	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±	±	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	
	± '	†	
	±	<u> </u>	
	<u>±</u>	<u>+</u>	
	<u>+</u>	<u>+</u>	
	<u>+</u>	<u>+</u>	
	±	<u>±</u>	
	<u>+</u>	<u>±</u>	
	±	±	
	<u>±</u>	±	
	±	±	
· · · · · · · · · · · · · · · · · · ·	±	<u>±</u>	
	±	±	
	<u>+</u>	±	
	±	±	
	<u>+</u>	±	
	± .	±	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

ikoży sud Kenith Physica

TO: a. F. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HpX-409	±	48/±2	per 100 ml
	±	±	
	±	±	
	<u>±</u>	±	
	±	±	
	<u>±</u>	±	
	<u>±</u>	±	
	± '	±	
	<u>±</u>	±	
	±	±	
	± ~	±	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>+</u>	<u>±</u>	
	<u>±</u>	±	
	±	<u>±</u>	
	<u>+</u>	±	
·	<u>±</u>	±	
	±	<u>±</u>	
	±	±	
	±	±	
	+	+	

±

File No. K-1004C-265 RC Issued 8-5-63 Type of Sample Water

- 1. The limit of error at the 95% certainty level has been estimated from the precision of control samples.
- 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

Sufedy and Health Physics

File No K-1004B-1141RO Issued 7-15-63 Type of Sample Wester

TO: a. J. Beeler.

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
H1X-408	±	11,835	fer100ml
/	±	<u>±</u>	,
	<u> </u>	<u>+</u>	
	İ	<u> </u>	
·	<u> </u>	1	
	<u>+</u>	<u>+</u>	
	±	<u>+</u>	
	±	<u>±</u>	
*	ż	<u></u>	
	±	±	
	±	±	
	<u>±</u>	±	
	±	<u>+</u>	
	<u>±</u>	主	
	<u>±</u>	<u> </u>	
	1	±	
	±	<u>±</u>	
	<u>±</u>	±	
	±	±	
	±	±	<u> </u>
	<u>±</u>	±	
	±	±	
_	±	±	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



APPROVED: AR Hymn

File No. K-1004B-114, RC Issued 7-5-63 Type of Sample Quarter

TO: a.J. Becher

Sample Number	Alpha Cts/min.	Betα Cts/min.	Remarks
Hpx-407	±	15313	per 100 ml
/	±	<u>+</u>	ν
	<u>+</u>	<u>+</u>	,
	<u> </u>	<u>±</u>	
	<u>+</u>	<u>±</u>	
	<u> </u>	<u>+</u>	
	<u>+</u>	±	
	<u>±</u>	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	
	± ±	<u>±</u>	
	<u>±</u>	+	
	<u>±</u>	±	
	<u>±</u>	<u>+</u> .	
	<u>±</u>	<u> </u>	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	

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File No. K-1004B-114, RC Issued 6-20-63 Type of Sample Water

TO: a.F. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-406	±		per 100 ml
	±	<u>+</u>	
	<u> </u>	<u>±</u>	
	±	<u>±</u>	
	±	±	
	#	±	
	ż	<u>+</u>	
	<u> </u>	<u>+</u>	
	± ±	± ±	
	<u>±</u>	±	
	± ±	±	
	<u>+</u>	±	
	<u>±</u>	<u>±</u>	
	<u>.</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	<u>+</u>	±	
	±	<u>±</u>	
	±	±	
	<u>±</u>	±	
	±	<u>±</u>	
_	· ±	±	

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APPROVED: a.R. J. S. Sweet

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RADIOACTIVITY ANALYSIS REPORT

File No. K-1004B114R0
Issued 5-24-63
Type of Sample water

TO: Mr. a. F. Beeker

Sample Number	Alphα Cts/min.	Beta Cts/min.	Remarks
4PX 404	<u>+</u>	4245	Per/100 mills
	±	±	
	<u> </u>	<u>±</u>	·
	±	<u>+</u>	
	<u>-</u> -	±	
	<u>+</u>	<u>±</u>	
	<u> </u>	<u>±</u>	
	<u> </u>	<u>±</u>	
	<u>+</u>	<u>+</u>	
	<u>+</u>	<u>+</u>	
	±	<u>±</u>	
	<u>±</u>	±	·
	±	± .	
	<u>+</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>.</u> ±	
	<u>±</u>	<u>+</u>	
	±	±	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>+</u>	
	±	±	
	±	±	
	±	±	

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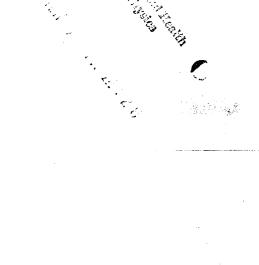
RADIOACTIVITY ANALYSIS REPORT

File No.	K-100	+-B-114,	RC
Issued_	5_2_6	3	
Tune of		Water	

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-403	±	4323 ±	Per 100 ml. water
	±	±	
	<u>+</u>	±	
	±	±	
	<u>±</u>	±	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	
-	± .	±	
	± -	±	
	±	±	
	±	<u>±</u>	
	±	±	
	±	<u>+</u>	
	<u> </u>	<u>+</u>	
	<u> </u>	±	
· · · · · · · · · · · · · · · · · · ·	± ±	± ±	
	±	±	
	±	±	
	±	· ±	
	±	±	

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APPROVED: a R Hynn

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RADIOACTIVITY ANALYSIS REPORT

File No K-1004B-114R 1 Issued 4-19-63 Type of Sample Water.

TO: a.J. Becker

0:_(1.); Bleket			
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HOX-402	±	6533	pu 100 ml
	±	±	
	±	±	
	±	±	
	: ±	±	
	<u>†</u> .	<u>±</u>	
	±	±	
	<u>+</u>	<u>+</u>	
	±	±	
	±	<u>+</u>	-
	±	±	
	±	<u>+</u>	
	±	<u>+</u>	
	<u>+</u>	<u>±</u>	
	±	<u> </u>	
	<u>+</u>	<u>±</u>	
	<u>+</u>	±	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	
	±	±	
	±	±	
	±	±	
	<u>±</u>	±	

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File No. K-1 COUB-114, RC Issued 4-8-63 Type of Sample Livater

TO: a.J. Beckez

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-401	<u> </u>	7022	per 100 ml
1	<u> </u>	±	"
	<u></u> 	. <u>±</u>	
	· <u>±</u>	<u>+</u>	
,	-	±	
	<u></u>	±	
	<u> </u>	±	
	<u> </u>	±	
	<u>÷</u>	<u></u>	
	<u>±</u>	<u>+</u>	,
	i i	±	
	<u>±</u>	<u>+</u>	
	<u>±</u>	<u>±</u>	
	Ė	<u> </u>	
	±	<u>+</u>	
	±	<u>+</u>	
	±	<u>±</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	土	<u>+</u>	
	±	±	

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APPROVED: AR Jame



TO: a.J. Becker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-400	<u>±</u>	8312	per 100 ml
	<u>+</u>	<u>+</u>	9
	<u>+</u>	. <u>±</u>	4
	<u>±</u>	<u>+</u>	
	<u>+</u>	<u>+</u>	
	<u> </u>	<u>+</u>	
	<u>+</u>	<u>±</u>	
	<u>+</u>	<u>±</u>	
	<u>±</u>	±	
1	<u>+</u>	± 	
	<u>+</u>	<u>±</u>	
	±	<u>+</u>	
	<u>±</u>	<u>±</u>	
	±	±	
	±	<u>±</u>	
	±	±	
	±	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	
	±	<u>±</u>	
	±	±	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	

- File No. K-1004B-114, KC Issued 3-28-63 Type of Sample Matter
 - 1. The limit of error at the 95% certainty level has been estimated from the precision of control samples.
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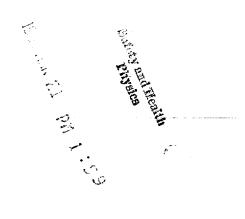
RADIOACTIVITY ANALYSIS REPORT

File No. K-1004B-114, RC Issued 3-20-63 Type of Sample illater

TO: a. J. Becker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-399	<u>+</u>	3226	per 100 ml
	<u>+</u>	±	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	±	±	
	<u>+</u>	±	
	±	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±	±	
	±	±	
	±	<u>+</u>	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	±	<u>±</u>	
	±	<u>±</u>	
	土	±	
	±	±	
	<u>±</u>	<u>+</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	

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TO: a. J. Becher

10: (1.5)	pecai		
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HUX-398	<u>+</u>	10,6-13	pu icenic
17"	<u></u>	± ±	
	<u>±</u>	<u>+</u>	
	<u></u>	<u>÷</u>	
	=	<u>+</u> 	
	<u></u>	<u>+</u>	
	÷	<u>*</u>	
	<u> </u>	<u></u>	
	<u> </u>	<u>-</u>	
	± —	<u>+</u>	
	±-	<u> </u>	
	±	÷	
	<u>+</u>	<u>+</u>	
	÷	<u></u>	
	<u> </u>	<u>.</u>	
	Ξ.	Ξ	
	<u>±</u>	<u>+</u>	
	±	<u> </u>	
	±	<u>+</u>	
	±	±	
	=	±	

<u>+</u>

<u>+</u>

- File No K-1004 B-114RC Issued 3-13-63 Type of Sample (Watter
 - The limit of error at the 95% certainty level has been estimated from the precision of control samples.
 - 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
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APPROVED: aR Hynn

File No 1-1064 8 -114, NC

Issued 2 - 2 - 6 - 5

Type of Sample 166 - 666

TO: a.f. Bealier

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HY 397	±	16,625	Pice 100mc
, , ,	<u>+</u>	<u>±</u>	
	<u>+</u>	<u></u>	
	<u>+</u>		
	±	±	
	<u> </u>	<u> </u>	
	±	<u> </u>	
	±	<u> </u>	
	<u>+</u>	<u>+</u>	
	±	±	
	±	<u>+</u>	
	<u>±</u>	±	
	· ±	<u>+</u>	
	+	<u>.</u>	
	<u>+</u>	<u>±</u>	
·	<u>+</u>	<u>+</u>	
	<u>±</u>	<u>+</u>	
	<u>±</u>	±	
	±	<u>±</u>	
	±	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	
	±	<u></u>	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



File No. K-16045-114, RC

Issued 3 15 63

Type of Sample 160 0 tr

TO: a. F. Keaker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HX-396	<u>±</u>	22,544	yer 100 m.C.
	±	±	V
	<u> </u>	<u>±</u>	- And Market
	±	±	
	<u>+</u>	<u>±</u>	
	<u>4.</u>	<u>+</u>	
	±	±	
	±	±	
	±	<u>+</u>	
<u></u>	±	<u>+</u>	
	±	<u>±</u>	
<u> </u>	<u>±</u>	<u>±</u>	
	. <u>±</u>	<u>+</u>	
	± ±	± ±	
	± ±	<u>+</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	土	±	
	±	±	
	<u>+</u>	±	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

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RADIOACTIVITY ANALYSIS REPORT

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File No 1 - 1004 B-11
Issued 7 - 8 - 6
Type of Sample 112 CA

TO: 17. F. Becker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HpX-395	<u>+</u>	24.料?	eer 140 ml
,	<u> </u>	±	
	<u>+</u>	<u>+</u>	
	土	<u> </u>	
	<u>±</u>	±	
	<u>+</u>	<u>±</u>	
	<u>±</u>	±	
	±	±	
	<u>+</u>	<u>+</u> -	
	±	<u>+</u>	
	±	±	
	±	<u>±</u>	
	<u>+</u>	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	±	
	±	<u>±</u>	
	±	±	
	±	<u>±</u>	
	±	<u>±</u>	
	±	±	
	±	<u>±</u>	
	±	±	
1	±	±	
	<u> </u>		

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APPROVED: ar Hymn



File No K-1004B-119, KC

Issued 1-30-63

Type of Sample 110 100

TO: H. F. Bucher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-,394	±	13,467	fier 100 mil
1	±	±	/
	±	<u>+</u>	rulli vangan
	±	+	in in the second
	±	<u>±</u>	
	盐	± 	
	±	±	
	<u>+</u>	÷	
	<u>±</u>	=	
	<u> </u>	<u>+</u>	
	± ±	±	
	<u>+</u>	;	
	<u>±</u>	±	
	<u>±</u>		
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u> </u>	
-	<u>±</u>	<u>±</u>	14
	±	<u>+</u>	
	±	<u>+</u>	
	±	<u>±</u>	
	±	±	
	± ±	±	
	±	± -	

- The limit of error at the 95% certainty level has been estimated from the precision of control samples.
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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

File No. K-1000B-114, RC
Issued 1-23-63
Type of Sample 2000CL

TO: (1.7. Becker

Sample Number	Alpha Cts/min.	Betα Cts/min.	Remarks
H1X-393	<u>+</u>	21,5=51	yen 100m
1/	<u> </u>	<u>+</u>	/
	<u>+</u> 	<u>+</u>	
	4	<u>.</u>	
	<u>+</u>	<u>±</u>	
-	<u>.</u>	<u>±</u>	
	±	±	
	<u>+</u>	±	
	<u>+</u>	<u>-</u>	
	±	÷	
	<u> </u>	±	
	<u>±</u>	+	
·	<u>+</u>	+	
	+	+	
	<u>±</u>	<u>±</u>	
	<u>±</u>	±	
	±	<u>+</u>	
	±	<u>±</u>	
-	±	±	
	±	<u>+</u>	
	±	<u>+</u>	
	± ±	± ±	

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APPROVED: a R Flynn

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JR-potofil

RADIOACTIVITY ANALYSIS REPORT

File No. K-1664B-114, RC Issued 1-16-63 Type of Sample Water

TO: a. 7. Becker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HUX-392	±	16,695	per 100 mc
/ / / /	±	±	√
	<u>+</u>	<u>+</u>	
	<u>±</u>	±	
	<u></u>	土	
	<u> </u>	±	
	±	<u>±</u>	
	±	±	
	±	±	
	±	<u>+</u>	
	<u>-</u> ±	±	
	±	<u>±</u>	
	<u>±</u>	+	
	<u>+</u>	<u> </u>	
	±	<u>±</u>	
	<u> </u>	±	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	
	<u>±</u>	±	

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APPROVED: approved: Alynn

Du - fel

RADIOACTIVITY ANALYSIS REPORT

File No. $\frac{N-1004B-114}{1-2-63}$ Type of Sample 11 261

TO: H.J. Decker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HVX-391		j	xic 10016
1/	<u> </u>	±	
·	±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	±	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	<u>+</u> .	
	<u>±</u>	<u>+</u>	
	±	<u>±</u>	
,	±	<u>±</u>	
	<u>+</u>	±	
	±	±	
	±	±	
	±	±	
	±	±	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

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APPROVED: UR Jun

J.S. Physe

RADIOACTIVITY ANALYSIS REPORT

TO: a.f. Becker

File No.	K-1004 B-114, RC
Issued_	12-11-62
Type of	Sample Licater

Sample Number Alpha Cts/min. Beta Remarks Cts/min. 100120 <u>+</u> ± ± \pm \pm \pm \pm <u>+</u> <u>+</u> <u>+</u> ± \pm ± \pm ± ± \pm \pm ± \pm ± ± \pm ± ± \pm ± ± ± ± ± ± ± ± ±

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

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APPROVED: aR Hymn

File No.	K-10	004 - B-114,	RC
Issued	11-2	28-62	
Type of		Water	

TO: A. F. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
PX - 389	±	15 , 742 <u>+</u>	Per 100 ml.
	<u>±</u>	±	
	±	±	
	±	<u>±</u>	
	±	±	
	±	<u>±</u>	
	±	±	
	±	±	
	<u>+</u>	±	
	±	±	
	±	±	
	± _	±	
·	±	±	
	<u>+</u>	<u>±</u>	
	±	±	
	<u>±</u>	±	
	±	<u>±</u>	
·	±±	<u>±</u>	
	±	±	
	±	±	
-	±	±	
	±	±	
	±	±	

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TO: a. J. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
PX-388	±	15,284	Ren. 100 ml
	<u>±</u>	± +	
	<u>+</u>	<u>+</u>	
	<u>+</u>	<u>±</u>	
	<u>+</u>	±	
	<u>+</u> ·	±	
	<u>±</u>	±	
	<u>±</u>	±	
	±	±	
	±	±	
	± .	±	
	±	±	
	<u>±</u>	±	
	<u> </u>	<u>±</u>	
	<u>±</u> .	±	
	<u> </u>	±	
	±	±	
	±	±	
	±	±	William Control of the Control of th
	±	±	
	±	±	
	±	±	
	±	±	

- File No A-10048-114, Pe Issued 11-12-62 Type of Sample Mealth
 - The limit of error at the 95% certainty level has been estimated from the precision of control samples.
 - 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
 - 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

TO: Q . 7. Becher

	7		
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-387	±	14,5=9.5	per 100 ml
	<u>+</u>	±	1
	±	±	
	<u>±</u>	±	
	±	±	
	±	±	
	±	±	
	. ±	±	
	<u>.</u> ±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	<u>±</u>	±	
	±	<u>±</u>	
	±	±	
	±	±	
·	±	±	
	±	<u>±</u>	
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- File No. K-1004B-114, RC Issued 10-30-62 Type of Sample Water
 - The limit of error at the 95% certainty level has been estimated from the precision of control samples.
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 - 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

File No. K-1004-B-114, RC

Issued 10-19-62

Type of Sample Water

TO: Mr. A. F. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-386	<u>±</u>	8814 ±	Per 100 ml. wate
	<u> </u>	±	
	<u>±</u>	<u>+</u>	
	<u>±</u>	±	
	±	<u>±</u>	
	<u> </u>	<u>±</u>	
	<u>±</u>	±	
	±	±	
	±	±	
	<u>+</u>	±	
	±	<u>±</u>	
	<u>.</u>	±	
	<u> </u>	±	
	<u>±</u>	<u> </u>	
	<u>±</u>	±	
	±	±	·
	<u>±</u>	±	
	<u> </u>	±	
	±	±	
	<u>±</u>	±	
	±	±	
	±	±	
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19th OUT 23 PM 3:50

APPROVED: Q. P. J. Lynn

File No.	K-1004-	B-114,	RC	
Issued_	10-16-6	2		
	Sample			

TO: A. F. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-385	±	40,542±	Per 100 ml.
	±	±	
	±	±	
	<u>+</u>	±	
	<u></u>	±	6 ,
	±	±	
	±	<u>±</u>	. 52
	±	±	1
	<u>±</u>	±	
	<u>±</u>	±	
	±	±	
	±	±	
	<u>+</u>	<u>+</u>	
	<u>±</u>	±	
	±	±	
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	±	±	
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	±	±	

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TO: a.J. Becker

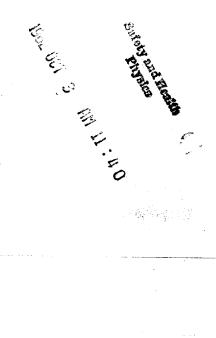
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
4px-384	±	25,683	per 100 m
	<u>±</u>	±	<i>V</i>
	<u>±</u>	±	
	±	±	
	±	±	
	<u>±</u>	±	
	±	±	
	±	<u>+</u>	
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File No. K-1064B-114, RC

Issued 10-2-62

Type of Sample 114

- 1. The limit of error at the 95% certainty level has been estimated from the precision of control samples.
- 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



APPROVED: <u>AR Hymn</u>

TO: a. J. Becher

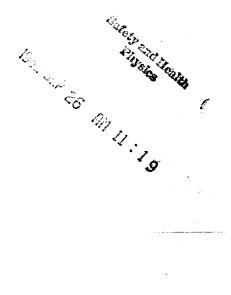
File No. 1-1-548-114,	<u> </u>
Issued 3-25-62	
Type of Sample 11) all	

Beta Sample Alpha Remarks Cts/min. Cts/min. Number 459 <u>#1</u> \pm <u>+</u> ± \pm \pm \pm \pm <u>+</u> ± \pm ± ± \pm ± \pm ± ± ± \pm ± ± ± ± + ± \pm Ψ. ± ± ± ± ± ± \pm ± ± ± ±

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



APPROVED: APJlynn

TO: A.F. Becker

<u></u>			•
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
Hpx-3 72	<u>±</u>	154±0	an mond
1,	±·	±	,
	±	±	
	<u>+</u>	±	
	±	±	
	±	±	
	±	±	

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File No K-10048-114, RC Issued 9-17-62 Type of Sample Water

- 1. The limit of error at the 95% certainty level has been estimated from the precision of control samples.
- 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

10: 1 Md AI FE

Bafety and Health Physics

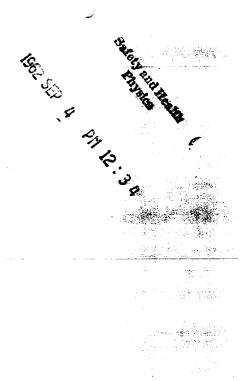
PPROVED:

TO: a. 7. Becker

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-381	±	2519	per 100 ml
· · · · · · · · · · · · · · · · · · ·	±	±	
	±	±	
	±	±	·
	±	±	
	±	±	
	±	±	,
	±	<u>±</u>	
	±	±	
	±	±	
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	±	±	
	±	±	
	±	±	
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	. ±	±	

File No K-1004B-114,80
Issued 8-31-62
Type of Sample Water

- The limit of error at the 95% certainty level has been estimated from the precision of control samples.
- 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



APPROVED: a R Hymn

TO: Mr. Blaker

Sample Alpha Cts/min. Remarks	10. protect					
	Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks		
± ± ± ±	HDX-350	±	1088	per loome		
	J	±	<u>+</u>	/		
± ± ± ±		<u>±</u>	<u>±</u>			
± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ±		±	<u>+</u>			
		<u>±</u>	±			
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± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ± ±		<u>+</u>	<u>+</u>			
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± ± ±		<u>±</u>	<u>±</u>			
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± ±		±	<u>±</u>			
± ±		±	±			
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- File No. K-1604B-114, RO Issued 8-21-62 Type of Sample 76 atta
 - 1. The limit of error at the 95% certainty level has been estimated from the precision of control samples.
 - 2. The alpha counting rates have been corrected to 50% geometry by comparison of results obtained by counting unaltered uranium with the published alpha specific activity.
 - 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.

Wiles S.

APPROVED: aR Hymn

TO: Mr Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-379	<u>±</u>	90 \$6	Per 100Ml
	<u>±</u>	<u>+</u>	0
	<u>+</u>	<u>±</u>	
	<u>+</u>	<u> </u>	
	<u>±</u>	· <u>+</u>	
	<u> </u>	±	
	<u>÷</u>	±	
	+	±	
	<u>+</u>	±	
I	<u>±</u>	±	
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	<u>±</u>	±	
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	<u>±</u>	±	
	±	<u>+</u>	
	±	±	
	±	<u>+</u>	

File No. 100 CB-114, P Issued 8-10-62 Type of Sample // All

- The limit of error at the 95% certainty level has been estimated from the precision of control samples.
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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



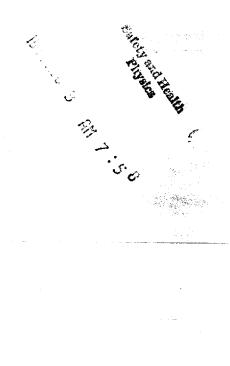
APPROVED: a R Flynn

File No.	K-1004-B-114, RC
Issued_	8-1-62
	Sample Water

TO. Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-378	<u> </u>	48,989±	Per 100 ml.
	±	±	
	±	±	·
	±	± .	
	±	±	
	±	<u>+</u>	
	±	±	
	±	±	·
	<u>±</u>	±	
	±	±	
	± .	±	
	±	±	
	±	±	
	<u>+</u>	<u>+</u>	
	<u>±</u>	土	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>±</u>	±	
	±	±	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	

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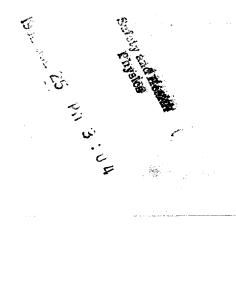
APPROVED: A Stynn

File No.	K-1004-B-114, RC
	7 - 23-62
	Sample Water

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-377	<u>±</u>	3305 ±	Per 100 ml.
	±	±	
	±	±	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	±	±	
	, ±	±	
	±	± .	
	<u>±</u>	±	
	±	. ±	
	±	±	
	±	±	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>±</u>	<u>+</u>	
	±	<u>±</u>	
	<u> </u>	±	·
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	
	±	±	
	±	±	

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- 3. The beta counting rates have been corrected to 100% geometry by comparison of results obtained by counting unaltered uranium with the published specific beta activity of normal uranium.



APPROVED: <u>AR Hymn</u>

File No. K-1004-B-114, RC

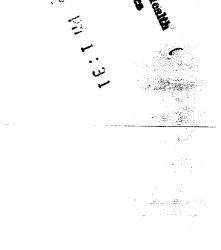
Issued July 12, 1962

Type of Sample Water

TO: Mr. Becher

то:тт. ве			
Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-376	<u>±</u>	29,927±	Per 100 ml.
	±	±	
	<u>+</u>	<u>±</u>	
	±	±	
	±	<u>+</u>	
	<u>±</u>	<u>+</u>	
	±	<u>±</u>	
	±	±	
	±	<u>+</u>	
	±	±	
	± .	±	
	±	<u>±</u>	
	<u>+</u>	<u> </u>	
	<u>+</u>	± .	
	±	<u>±</u>	
	<u>+</u>	±	
	±	±	
	<u>±</u>	<u>±</u>	·
	±	±	
	±	<u>+</u>	
	±	±	
	±	±	
	±	<u>+</u>	

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APPROVED: AR Flynn

File No.	K-1004-B-114, RC	
	June 27, 1962	_
	Sample Water	

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-375	±	4,196 <u>+</u>	Per 100 ml.
	±	<u>±</u>	
	<u>+</u>	±	
	<u>±</u>	±	
	<u>±</u>	±	
	± ±	<u>+</u>	
	±	<u>+</u>	
	±	±	
	<u>±</u>	<u>+</u>	
·	±	±	
	± -	<u>±</u>	
	±	±	
	<u>±</u>	<u>±</u>	
	± ±	±	
	± ±	<u>+</u>	
	± ±	<u>±</u>	
	<u>±</u>	<u>±</u>	
	±	±	
	± ±	<u>±</u>	
	±	<u> </u>	
	± ±	<u></u> ±	
	<u>±</u>	±	
	±	±	

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APPROVED: AR Shynn

File No. K-1004-B-114, RC

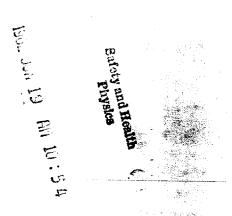
Issued 6-18-62

Type of Sample Water

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta	Remarks
	Cts/min.	Cts/min.	Relative
HPX-374	<u>±</u>	16,586±	Per 100 ml.
	<u>±</u>	<u>±</u>	
	<u>+</u>	<u>±</u>	
	±	±	
	<u>±</u>	±	
	<u>±</u>	<u>+</u>	
	±	<u>.</u> ±	
	±	±	
	±	±	
	. ±	±	
	±	±	
	<u>+</u>	±	
	±	±	
	<u>±</u>	±	
	<u>±</u>	±	·
	±	<u>±</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	±	<u>+</u>	·
T	±	±	

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APPROVED: AR Flynn

To: Mr Bichic

File No Issued_	K-1004 B-114,1
	Sample ((. (!

Sample Number	Alpha Cts/min.	Betα Cts/min.	Remarks
HYX-373	<u>+</u>	19,9=27	per 100 mc
	±	±	/
	<u>+</u>	<u>+</u>	
	<u>±</u>	±	
	<u>±</u>	<u>+</u>	
	<u>±</u>	±	
	<u>+</u>	土	
	<u>±</u>	±	
	±	±	
<u></u>	±	±	
	±	<u>+</u>	
	±	±	
	<u>±</u>	±	
	<u>+</u>	±	
	<u>±</u>	±	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	<u>+</u>	±	
	±	<u>+</u>	
	<u>±</u> .	±	
	<u>+</u>	<u>+</u>	
	±	±	
	±	<u>±</u>	

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APPROVED: AR Hymn

File	No.	<u>K-lo</u>	04-B-114,	RC
Issue	ed	5 - 29	-62	
Type	٥f	Sample_	Water	

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-372	±	3933 <u>+</u>	Per loo ml.
	±	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	<u>+</u>	
	<u> </u>	±	
	<u>±</u>	土	
	±	±	
	±	±	
	<u> </u>	±	
	±	±	
	<u> </u>	±	
_	<u>±</u>	<u>+</u>	
	<u>±</u>	±	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	±	
· .	<u>±</u>	<u>±</u>	
	<u>±</u>	±	
	±	±	
	±	±	
	<u>±</u>	±	
	±	±	

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APPROVED: aR Thymus

File No.	K-1004-B-114,	, RC
Issued_	5 - 16 - 62	
	Sample Water	

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-371	±	12,660 <u>+</u>	Per 100 ml.
	±	±	
	±	±	
	<u>±</u>	<u>+</u>	
	±	<u>+</u>	
	<u>+</u>	<u>+</u>	
	<u>+</u>	±	
	<u>±</u>	±	
	<u>±</u>	<u>+</u>	
	土	±	
	± .	±	
	±	± .	
	±	±	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	±	±	
	<u>±</u>	<u>±</u>	
	±	±	
	±	<u>±</u>	
	±	±	
	±	±	
	±	±	
	<u>±</u>	±	

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APPROVED: a R Hypn

File No. K-1004-B-114, RC

Issued 4-26-62

Type of Sample Water

TO: Mr. Becher

Sample Number	Alphα Cts/min.	Betα	
	Cts/min.	Cts/min.	Remarks
HPX-370 W	+	17,686±	Per 100 ml.
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	<u>+</u>	±	
	<u>±</u>	±	
	<u>+</u>	±	
	±	±	
	<u>+</u>	±	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	±	±	
	<u>+</u>	±	
·	±	±	
	±	±	
	<u>+</u>	±	·
	<u>+</u>	±	
	±	<u>±</u> :	
	±	±	

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APPROVED: AR Thymas

File No.		04-B-114,	RC
Issued_	רר		
Type of		Water	

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-369W	±	21,355 <u>+</u>	Per 100 ml.
	±	±	
	<u>±</u>	<u>±</u>	
	± '	<u>+</u>	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>+</u>	±	
	±	±	
	±	±	
	±	±	
	±	±	
	±	<u>±</u>	
	±	<u>+</u>	
	<u>+</u>	<u>±</u>	
	±	±	
	<u>+</u>	<u>+</u>	
	±	±	
·	<u> </u>	土	
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	

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APPROVED: (1) K Heym

File No. K-1004-B-114, RC

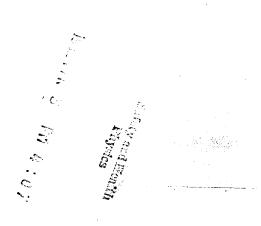
Issued 4-3-62

Type of Sample Water

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
PM-368 W	±	21,695 <u>+</u>	Per 100 ml.
	±	±	
	<u>+</u>	±	
	<u>+</u>	±	
	±	±	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>+</u>	<u>+</u>	
	±	<u>+</u>	
	±	±	
	<u>.</u>	±	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	±	<u>±</u>	
	±	±	
	±	±	
	±	<u>+</u>	
	±	±	
	±	±	
	±	±	
	±	±	

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APPROVED: ARTHYRN

File No. K-1004-B-114, RC

Issued 3-21-62

Type of Sample Water

TO: Mr. Becher

Sample Number	Alphα Cts/min.	Beta Cts/min.	Remarks
ipx-367 w	<u>±</u>	19,677 <u>4</u>	Per 100 ml.
	<u>±</u>	<u>±</u>	
	<u>+</u>	<u>±</u>	
	±	<u>±</u>	
	<u>+</u>	±	
	<u>+</u>	<u>+</u>	
	<u>+</u>	<u>.</u>	
	<u>±</u>	±	·
	±	±	
	±	±	
	± .	±	
	<u>+</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>±</u>	
	<u>±</u>	<u>+</u>	
	<u>+</u>	<u>+</u>	
	±	<u>+</u>	
	±	±	
	±	±	
	±	±	
	±	±	
	±	±	
	<u>±</u>	±	

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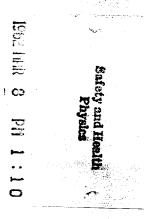
y I S. Sweet

File No. K-1004-B-114, RC
Issued 3-6-62
Type of Sample Water

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
PX-36 6w	±	16,637±	Per 100 ml.
	<u>+</u>	±	
	<u>±</u>	<u>+</u> .	
	<u>±</u>	<u>±</u>	
	±	±	
	<u>±</u>	±	
	<u>.</u> ±	±	
	<u>+</u>	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	±	
	<u> </u>	±	
·	±	±	
	±	<u>+</u>	
	±	<u>±</u>	
	±	<u>±</u>	
	<u>±</u>	±	
	± ·	±	
	<u>±</u>	±	
	±	±	
	±	±	
	<u>±</u>	±	
	±	±	
	±	±	

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APPROVED: R. P. Janes

File No	K-1004-B-114, RC	
Issued_	2-27-62	
	Sample Water	

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Seta Es/min.	Remarks
HPX-365-W	±	30,216 <u>+</u>	Per 100 ml.
	±	±	
	<u>+</u>	±	
	±	±	
	<u>±</u>	±	
	±	±	
	±	±	
	<u>+</u>	<u>±</u>	
	±	±	
	±	<u>+</u>	
	<u>.</u>	±	
	±	±	
	±	±	
	<u>+</u>	<u>+</u>	
	±	±	
	±	土	
	<u>±</u>	<u>±</u>	
	±	±	
	±	±	
	±	±	
	±	±	·
	±	±	
	<u>±</u>	±	

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APPROVED: a R Hymn

Sampled. 1-26-62

RADIOACTIVITY ANALYSIS REPORT

File No. K-1004-B-114, RC

Issued 2-7-62

Type of Sample Water

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-364-W	±	33,219±	Per 100 ml.
	<u>±</u>	±	
	<u> </u>	±	
	±	<u>±</u>	
	±	±	·
	±	<u>+</u>	
	±	±	
	<u>+</u>	±	
	<u>+</u>	<u>+</u>	
	±	±	
	±	±	
	±	<u>+</u>	
	<u>±</u>	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	±	
	<u>±</u>	<u>±</u>	
	±	<u> </u>	
	<u>±</u>	<u> </u>	
	<u>±</u>	±	
	±	±	
	±	±	
	±	±	
	±	±	

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Safety and Health
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APPROVED: approved: approved:

File No. <u>E-1004-B-114</u>, RC

Issued <u>1-23-62</u>

Type of Sample leter

TO: Mr. Becher

Sample Number	Alpha Cts/min.	Beta Cts/min.	Remarks
HPX-3634	±	30,948±	Per 100 ml.
	±	±	
	<u>±</u>	±.	
	土	<u>±</u>	
	±	±	
	± .	±	
	±	<u>+</u>	
	±	±	
	±	<u>+</u>	
	±	±	
	± .	<u>±</u>	
	<u>±</u>	±	
	<u>±</u>	<u>+</u>	
	<u>±</u>	<u>±</u>	
	<u>+</u>	±	
	<u>±</u>	土	
	<u>±</u>	<u>±</u>	
	<u>±</u>	±	
	±	±	
	<u>+</u>	±	
	±	±	<u> </u>
	<u>+</u>	±	
	±	<u>±</u>	

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APPROVED: aR Flynn

TO: Mr. Beaher

File No. 4-1004B 114 Re	_
Issued	_
Type of Sample coater	_

Sample Number Alpha Beta Cts/min. Remarks Cts/min. X3621 Per/200 me ust <u>+</u> ÷ ± \pm \pm <u>+</u>. \pm \pm ± \pm ± \pm ± ± ± \pm + \pm \pm ÷ \pm \pm ± \pm \pm

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APPROVED: A R. Flynn